

MISSOURI DEPARTMENT OF TRANSPORTATION 5-YEAR ROAD AND BRIDGE PROGRAM

From The Office Of State Auditor Claire McCaskill

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The following conditions were reported related to an audit conducted by our office of the Missouri Department of Transportation 5-Year Road and Bridge Program.

Our audit of the 5-Year Plans of the Missouri Department of Transportation (MoDOT) disclosed that more accountability over the plans is needed. MoDOT has not established a performance-based management system with goals or performance measures used in developing the 5-Year Plans that would determine the progress towards improving the state's highway system. Therefore, the awarding and/or completion of projects on the 5-Year Plans does not clearly correlate to any pre-established goals. In addition, the department does not formally compare and report on a summarized basis the projects programmed for award to those actually awarded annually.

In a response to the audit, MoDOT indicated it continually seeks ways to improve its accountability and its reporting mechanisms. MoDOT indicated the department has developed both system goals and performance measures to guide the direction of the department and the Missouri Highway and Transportation Commission formally adopted the goals in June 2001. The goals cited by MoDOT in its response included: ensure safety and security, relieve congestion, facilitate the efficient movement of goods, and enhance the quality of our communities. Some of the measures cited included: number of projects awarded vs. programmed projects, cost of awarded projects vs. programmed costs, and projects completed by month, quarter, and year.

In a comment to MoDOT's response, we commended MoDOT for its recognition of the need to develop goals and performance measures to improve its accountability and reporting mechanisms. However, we noted the goals cited in MoDOT's response cannot be easily quantified and the measures established by the department appear to be elements of a project management system instead of measures to monitor the overall improvement in the quality of the state's highway system. We believe additional goals/measures that can be quantified and measure the overall condition of the highway system would enhance the department's system of accountability. For example, establishing goals such as achieving a specified percent of roadways on the National Highway System as being rated good or better or a specified percent of state owned bridges being rated good or better, and then monitoring the progress toward the attainment of those goals, would allow MoDOT to determine whether progress was being made toward improving the highway system.

Background Information

- In 1992, the Missouri Department of Transportation adopted a 15-Year (1992-2007) Road and Bridge Program (15-Year Plan).
- The State Auditor's review of the 15-Year Plan, issued in October 1997, disclosed the department did not adequately monitor progress on the plan. Among other things, the department did not track the plan's actual construction costs by project or periodically compare the original estimated costs to actual costs incurred and did not consider inflation in its cost estimates when developing the plan.
- In November 1998, the department concluded that the initial cost estimates for the 15-Year Plan were substantially understated and the underlying assumptions were not correct, and it was not possible under any reasonable assumptions, for the department to complete the 15-Year Plan with currently anticipated revenues. The 15-Year Plan was replace with the 5-Year Plan. The 5-Year Plan is a rolling plan, in that as each year of the plan is completed, a new year is added.

Since our review of the 15-Year Plan in 1997, the State Auditor's office has noted improvement in the department's monitoring and oversight of its road and bridge program; however, as noted above, further improvements are needed.

MISSOURI DEPARTMENT OF TRANSPORTATION 5-YEAR ROAD AND BRIDGE PROGRAM

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STATE AUDITOR'S REPORT



CLAIRE C. McCASKILL

Missouri State Auditor

Honorable Bob Holden, Governor and
Missouri Highway and Transportation Commission and
Henry Hungerbeeler, Director
Missouri Department of Transportation
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We have audited the 5-Year Road and Bridge Program of the Missouri Department of Transportation (MoDOT). The objectives of this audit were to:

- 1. Determine if the MoDOT has established appropriate goals or performance measures and whether such goals/measures have been used in developing the 5-Year Plans.
- 2. Determine the status of the fiscal years 2000 and 1999 projects in the 5-Year Plans (from July 1, 1999 to June 30, 2004 and July 1, 1998 to June 30, 2003).
- 3. Determine if the MoDOT has adequately monitored the progress of the 5-Year Plans.

Our audit was conducted in accordance with applicable standards contained in *Government Auditing Standards*, issued by the Comptroller General of the United States, and included such procedures as we considered necessary in the circumstances. In this regard, we interviewed department personnel, reviewed various internal and public documents and records, and analyzed and compared data obtained from department personnel and the project database.

As part of our audit, we assessed the department's management controls to the extent we determined necessary to evaluate the specific matters described above and not to provide assurance on these controls. With respect to management controls, we obtained an understanding of the design of relevant policies and procedures and whether they have been placed in operation and we assessed control risk.

Our audit was limited to the specific matters described above and was based on selective tests and procedures considered appropriate in the circumstances. Had we performed additional procedures, other information might have come to our attention that would have been included in this report.

The accompanying Management Advisory Report presents our findings arising from our audit of the Missouri Department of Transportation, 5-Year Road and Bridge Program.

Claire McCaskill State Auditor

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April 20, 2001 (fieldwork completion date)

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EXECUTIVE SUMMARY

MISSOURI DEPARTMENT OF TRANSPORTATION 5-YEAR ROAD AND BRIDGE PROGRAM EXECUTIVE SUMMARY

The Missouri Department of Transportation (MoDOT) is responsible for administering the state's transportation programs, with oversight by the Missouri Highway and Transportation Commission (MHTC). The MoDOT has more than 6,000 employees in ten districts and a general headquarters. With annual expenditures of over \$1.6 billion, the MoDOT operates the 6th largest state-maintained highway system (over 32,000 miles of road/69,000 lane-miles) in the nation, and is also responsible for multimodal operations which include mass transit, airports, waterways, and rails. How well the department accomplishes its mission plays a major role in Missouri's economic development, environment, and quality of life.

In 1992, the MoDOT adopted a 15-Year (1992-2007) Road and Bridge Program (15-Year Plan). The State Auditor's review of the 15-Year Plan, issued in October 1997, disclosed the department did not adequately monitor progress on the plan. The department did not track the plan's actual construction costs by project or periodically compare the original estimated costs to actual costs incurred; did not consider inflation in its cost estimates when developing the plan; did not adequately prioritize and periodically reevaluate projects; and did not adequately monitor estimated and actual revenues and project costs.

In November 1998, the department submitted its first Annual Report to the Joint Committee on Transportation Oversight, and concluded that the initial cost estimates of the 15-Year Plan were substantially understated and the underlying assumptions were not correct. The MoDOT indicated that it was not possible under any reasonable assumptions, for the department to complete the 15-Year Plan with currently anticipated revenues. Thus, the 15-Year Plan was replaced with a 5-Year Plan. The department is responsible for implementing the 5-Year Plan approved by the MHTC, and adhering to all federal and state regulations.

The 5-Year Plan is a rolling plan, in that as each year of the plan is completed, a new year is added. The plan relies on currently anticipated revenues, and it specifies projects expected to be placed under contract in the applicable years. The plan also includes programmed costs for preliminary engineering, construction engineering, and right-of-way.

The MoDOT's first 5-Year Plan covered the period from July 1, 1998 to June 30, 2003 (1999-2003). The second 5-Year Plan covered the period from July 1, 1999 to June 30, 2004 (2000-2004), and the third 5-year plan covers the period from July 1, 2000 to June 30, 2005 (2001-2005). According to the department, projects are reprioritized and added to the plan based upon urban planning organization decisions, adjustments for unforeseen circumstances, or to accommodate changes in environmental review or right-of-way acquisition.

Since our review of the 15-Year Plan in 1997, we have noted improvement in the department's monitoring and oversight of its road and bridge program. When construction projects are completed, the estimated cost is now compared to the actual costs incurred. In addition, reasons are provided for projects where there is a difference of more than 10 percent or \$5 million

between the estimated and actual cost. The department also reevaluated all project cost estimates for the 1999-2003 plan, and an inflation factor is included in the cost estimates for projects placed on the 5-Year Plan. The department developed written criteria for the prioritization (selection) of projects, and each year the department lists the projects that were reprioritized (priority changed) on the 5-Year Plan and identifies the reasons for the reprioritization. Also, each year the department lists projects added to the 5-Year Plan, and provides an explanation of why a project was added.

However, our audit of the 5-Year Plans disclosed that more accountability over the plans is needed. The MoDOT has not established a performance-based management system with goals or performance measures used in developing the 5-Year Plans. Therefore, the awarding and/or completion of projects on the 5-Year Plans does not clearly correlate to any preestablished goals. In addition, the department does not formally compare and report on a summarized basis the projects programmed for award to those actually awarded annually.

MANAGEMENT ADVISORY REPORT

MISSOURI DEPARTMENT OF TRANSPORTATION 5-YEAR ROAD AND BRIDGE PROGRAM MANAGEMENT ADVISORY REPORT

5-Year Road and Bridge Program

Using reports and information obtained from the MoDOT and data from the department's project database, we analyzed the department's progress regarding the 5-Year Plans. We also reviewed program revenues, available construction dollars, and actual construction dollars spent on the plan projects; the projects programmed (estimated costs of the projects to be awarded) for fiscal years 2000 and 1999 and determined the results of the 2000 and 1999 construction schedule; and the department's policies and procedures used to monitor the progress of the plan. On a limited basis, we performed tests to determine the reliability of the MoDOT's project database information that we used in this report. Our audit disclosed the following:

A. Background Information

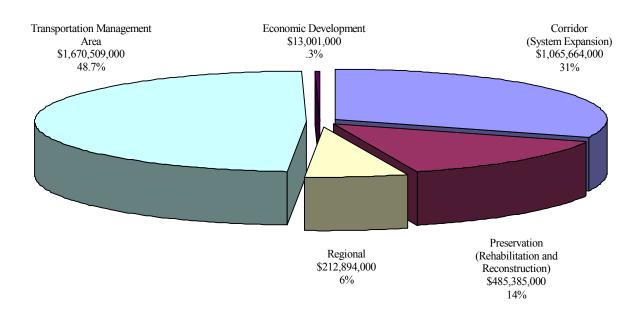
As part of the 15-Year Plan, in April 1995, the MoDOT adopted a Short-Term Action Plan (STAP). The STAP was initially scheduled to end December 31, 1998; however, the department extended the STAP to December 31, 1999. Thus, the fiscal year 1999 projects on the first 5-Year (1999-2003) Plan were essentially the STAP projects. Except for projects reprioritized and added, the 2000-2004 plan projects for the fiscal years 2000 to 2003 were the same as in the 1999-2003 plan. For fiscal year 2004, the plan included several hundred million dollars that had been set aside, but not specifically earmarked to specific projects. In addition, the 2001-2005 plan identifies projects for fiscal years 2001–2003 and a limited number for fiscal year 2004. Projects for the remainder of 2004 and 2005 will be added using the Long-Range Transportation Plan.

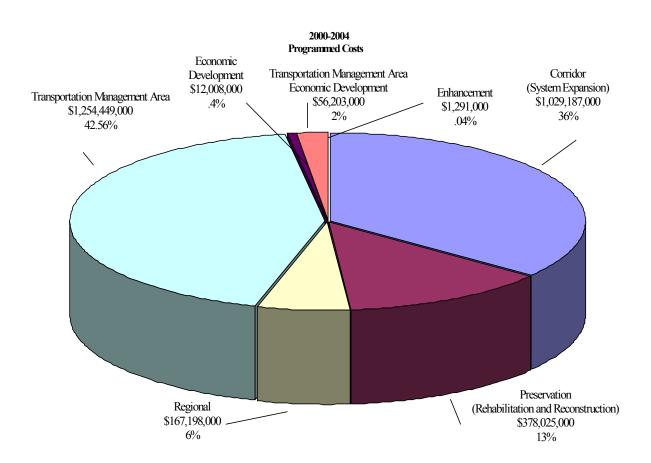
The MoDOT indicated it planned to identify future projects for which this money will be used based on a Needs Study and a Long Range Transportation Plan. A draft Needs Study and Long Range Transportation Plan (LRTP) was completed in September 2000, and will be used to identify projects for subsequent 5-year plans.

The 1999-2003 plan included 909 projects with total programmed costs (contracts to be awarded) of \$3,447,453,000, the 2000-2004 plan included 870 projects with total programmed costs of \$2,898,361,000, and the 2001-2005 plan included 912 projects with total programmed costs of \$2,671,947,000. The projects on the plans are identified by various categories such as corridor projects, preservation projects, regional projects, Transportation Management Area projects, economic development projects, and enhancement projects. In the 2001-2005 plan, system expansion replaced the corridor category and rehabilitation and reconstruction replaced the preservation category. These changes in terminology were made to more clearly reflect the activities in these categories.

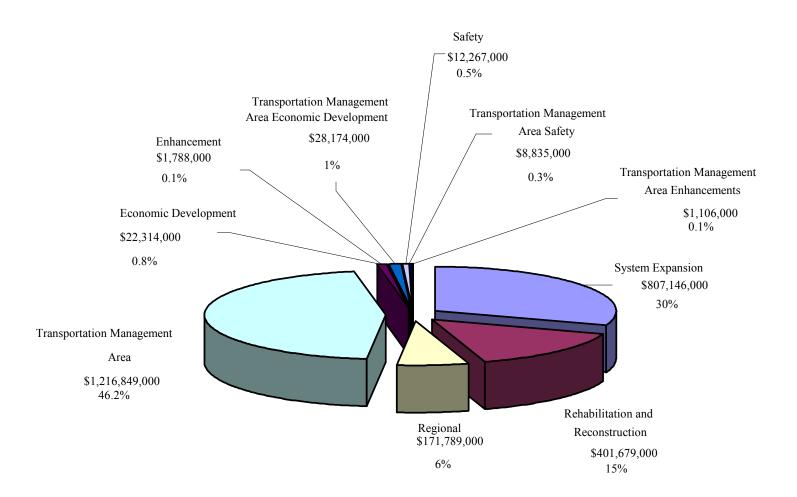
The programmed costs by category for these three plans are as follows:

1999-2003 Programmed Costs





2001-2005 Programmed Costs



Corridor (System Expansion) projects involve high priority rural roads connecting Missouri cities and/or out-of-state metropolitan areas. These roads largely represent Missouri's portion of the National Highway System (NHS). Preservation (Rehabilitation and Reconstruction) projects involve the resurfacing and/or rehabilitating of existing roads and bridges. Regional projects are district specific and generally only benefit the citizens who live in that particular district. Transportation management area projects are those involving metropolitan planning organizations for St. Louis and Kansas City. Economic development projects are projects that directly enhance the economic well-being of Missouri. Enhancement projects are projects which are over and above what is considered normal construction or maintenance, such as facilities for bicycle riders and pedestrians, landscaping and other scenic beautification, historic preservation, archaeological site preservation, etc. Safety projects are projects which reduce accidents at high accident locations and include activities such as traffic lights and signs, turning lanes, realignment of roadways, etc.

B. Lack of Plan Goals

We determined that as of April 2001 (almost three full years into the inception of the 5-Year Plan process), the department has not established formal goals nor has it established formal performance measures or standards. Funding for the road and bridge program should not be measured by simply comparing available funds to a list of potential projects. Instead, it is better to link the amount of available funding to performance objectives, such as striving to maintain pavement condition at a predetermined level and to know how different levels of funding would affect these performance objectives. In addition, highway projects involving expansion or safety need to be evaluated on a cost-benefit basis.

According to Governmental Accounting Standards Board (GASB)'s Concepts Statement No. 2 "Service Efforts and Accomplishments Reports," performance goals would allow a government entity to measure quantitatively its success in meeting predetermined targets on a periodic basis. By establishing performance goals/standards, the department would know how it is performing relative to the plan and could identify potential deficiencies that require increased attention. A performance measuring system measures changes (outcomes) that occur as a result of resources used (inputs) and includes standardized, measurable indicators of performance.

For example, goals for a road and bridge program might be that a specified percent of roadways on the NHS be rated as good or better; that a specified percent of state owned bridges be rated as good or better; and/or that the percent of crashes where road-related conditions are a contributing factor is below an established percent, with these standards to be met over a predefined period of time. Projects could then be selected that would help achieve the goals established. Therefore, the specific number of miles of new lanes of roadway, the number of bridges rehabilitated, the number of miles resurfaced, etc., could be established each year to meet the overall goal(s). The department could then measure changes that occur such as an increase in bridge sufficiency ratings, the decrease in the number of deficient bridges, the number of miles of roadway with a specific

pavement rating, etc., against the established goals, to determine the extent of progress in meeting those goals.

According to MoDOT personnel, one purpose of the Needs Study and the LRTP is to define performance measures that will be used to track the quality of the state transportation system. The department indicated that the LRTP will "include a comprehensive assessment of the state's existing transportation system and its needs, develop standards by which the system's condition will be judged in the future and establish ways to identify and prioritize improvements." In addition to roads and bridges, the LRTP will also examine other modes of transportation such as aviation, rail, waterways, and mass transit. The Needs Study is a component of the LRTP and will provide the department "a more clear understanding of the condition of the existing transportation system as well as an evaluation of acceptable levels of service, which will help MoDOT plan and prioritize future improvements."

However, the draft LRTP did not include performance measures. MoDOT personnel indicated that the department decided to include performance measures in a separate plan, entitled the Investment Strategy Plan. As of April 2001, the Investment Strategy Plan had not been completed. In addition, a time frame has not been established for approval of either the LRTP or the Investment Strategy Plan by the Commission.

While department officials indicated performance goals and measures were in the process of being established at the time of the audit, such goals/measures were not in place for projects planned and awarded in fiscal years 1999 through 2001. The MoDOT should ensure performance goals/measures are established and used in developing the 5-Year Plans as soon as practical.

C. Monitoring the 5-Year Plan

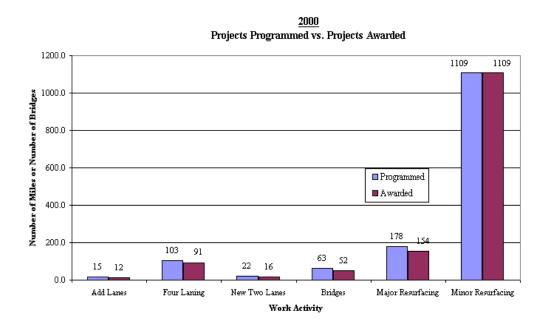
1. The department does not formally compare and report on a summarized basis the projects programmed for award to the projects actually awarded annually. Therefore, the department does not adequately monitor and report planned activity compared to actual activity. In addition, for fiscal years 2000 and 1999 (the only years completed to date in the 5-year Plan cycle), the department overprogrammed projects to be awarded. They placed more projects on the plans than there were funds available for award.

We compared projects programmed for award in 2000 and 1999 to the projects actually awarded in 2000 and 1999. The original programmed costs for fiscal year 2000 involved 247 projects totaling \$1,113,361,000 in the 2000-2004 plan. During fiscal year 2000, the department awarded 3 additional projects totaling \$6,057,000 which were not originally programmed, but reprioritized (deferred to later years or eliminated) 59 other projects totaling \$238,063,000. Thus, 191 projects totaling \$881,355,000 were awarded in fiscal year 2000. The original programmed costs for fiscal year 1999 involved 216 projects totaling \$1,096,428,000 in the 1999-2003 plan. During fiscal year 1999, the department

awarded 24 additional projects totaling \$98,684,000 which were not originally programmed, but reprioritized 53 other projects totaling \$335,540,000. Thus, 187 projects totaling \$859,572,000 were awarded in fiscal year 1999.

The reprioritized projects in fiscal years 2000 and 1999, totaling \$238,063,000 and \$335,540,000 represented about 21 percent and 31 percent of the programmed totals of \$1,113,361,000 and \$1,096,428,000, respectively. From the reprioritized projects in fiscal year 2000, projects totaling \$172,865,000 were programmed for fiscal year 2001; projects totaling \$18,488,000 were programmed for fiscal year 2002; projects totaling \$44,874,000 were programmed for future years (outside the 5-year time frame); and projects totaling \$1,836,000 were combined with other projects. From the reprioritized projects in fiscal year 1999, projects totaling \$260,417,000 were programmed for fiscal year 2000; projects totaling \$59,141,000 were programmed for fiscal year 2001; projects totaling \$541,000 were programmed for future years; and projects totaling \$15,441,000 were eliminated. The projects eliminated represent approximately 1 percent of the totaled projects programmed in fiscal year 1999.

From the department's project database, we compared the work activities originally programmed for award to those actually awarded for fiscal years 2000 and 1999 with the following results:

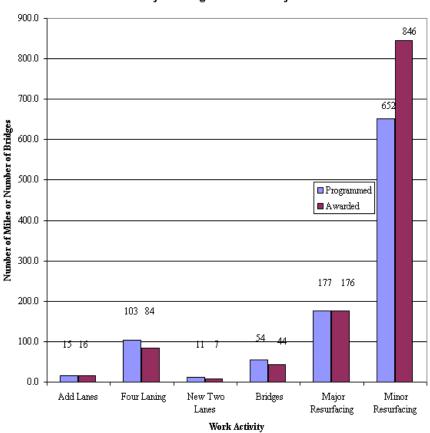


Because projects were over-programmed, added to, or reprioritized in fiscal year 2000, the MoDOT did not award as planned the following activities:

- 1 major bridge project
- 7 bridge replacement projects
- 3 bridge retrofit and strengthening projects

- 9 miles of new or improved lanes
- 12 miles of four-lanes
- 24 miles of high-type resurfacing
- 2 miles of freeway
- 3 enhancement projects

<u>1999</u> Projects Programmed vs. Projects Awarded



Because projects were over-programmed, added to, reprioritized, or removed in fiscal year 1999, the MoDOT did not award as planned the following activities:

- 4 bridge replacement projects
- 19 miles of four-lanes
- 1 mile of high-type resurfacing
- 3 miles of interchanges
- 1 major bridge project
- 2 bridge rehabilitation projects
- 3 bridge retrofit projects
- 4 miles of new or improved two-lanes
- 1 mile of pavement replacement

The MoDOT should formally review and report the results of the 5-Year Plans on an annual basis to determine whether projects are awarded as scheduled and any progress toward any established performance goals. In addition, the MoDOT should not over-program and only place projects on the plans for which there are sufficient funds available for award. According to MoDOT personnel, the department did not knowingly over-program projects in the 2001-2005 plan.

2. While the MoDOT has not established performance goals/measures nor performed an annual comparison of projects programmed for award to those actually awarded, the department does prepare and make public other information related to the 5-Year Plan. The department submits an annual report to the Joint Committee on Transportation Oversight each November, and the report is available to the public on the department's Internet website.

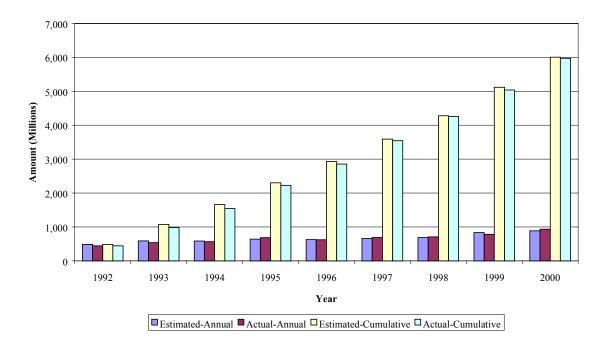
Besides a detailed listing of projects on the current 5-Year Plan, the report includes a listing of new or reprioritized projects along with an explanation of how the project met the selection method/criteria; a listing of projects which were under construction in the prior fiscal year and a comparison of programmed to actual costs; and a listing of projects completed in the prior fiscal year with a comparison of programmed to actual costs, with reasons provided when there is a difference of more than 10 percent or \$5 million between the programmed and actual costs.

However, these reports don't indicate how well the department is doing overall in improving the condition of the state's roads and bridges. This type of information will only be available when the department establishes performance goals and measures; when the 5-Year Plan projects are selected based on these goals/measures; and when annual accomplishments are compared to the goals.

3. The 5-Year Plans rely only on currently anticipated revenues for the years specified. Thus, a significant component in the success or failure in meeting the 5-Year Plans is the accuracy of the estimates of revenues; non-construction expenditures (maintenance, department administration, and other state agencies); and the funds available for construction (right-of-way, preliminary engineering, construction engineering, and construction).

The MoDOT continually updates its estimates of revenues and disbursements through a specialized software system. We did not perform an in-depth review of the underlying assumptions, trend lines, growth analyses, and system reports, etc.; however, from the MoDOT's data, we compared the estimated funds available for construction to actual funds available for construction for 1992 to 2000 as presented below:

Total Available for Construction Annual and Cumulative



The actual funds available for construction in fiscal years 1999 and 2000 are within 6 percent (plus/minus) of the estimated funds available. In addition, the actual cumulative funds through 2000 is less than the estimated cumulative funds by under 1 percent. Therefore, it appears the MoDOT's monitoring and updating of its projected revenues/funds available for construction assumptions has been reasonably adequate and accurate.

While we noted improvement in the department's monitoring and oversight of its road and bridge program, our audit of the 5-Year Plans disclosed that more accountability over the plans is needed. The MoDOT has not established a performance-based management system with goals or performance measures of the 5-Year Plans. Therefore, the awarding and/or completion of projects on the 5-Year Plans do not correlate to any pre-established goals. In addition, the department does not compare the projects programmed for award to those actually awarded on an annual basis. Doing so, would help the department determine if the plan is on schedule.

WE RECOMMEND the MoDOT establish a performance-based management system and use it in developing the 5-Year Plans. Such a system should include setting measurable targets for accomplishments/desired outcomes (especially long-range goals) and developing and reporting indicators that measure the progress in achieving the goals/objectives. In addition, the department should formally compare and report on a summarized basis the projects programmed for award to the projects actually awarded annually.

AUDITEE'S RESPONSE

MoDOT continually seeks ways to improve its accountability and its reporting mechanisms. In addition to the Annual Report submitted to the General Assembly each November, the department has established Organization Performance Measurements, discussed more fully below, based on work completed in the department's Strategic Plan, revised September 1, 2000, and the department's Business Plan, implemented July 17, 2000. Further, in September of 2000 the department's draft Long-Range Transportation Plan (LRTP) was published. It contains the overall policies for the state's transportation system. These are reflected in the projects that were incorporated in the Statewide Transportation Improvement Program (STIP) in the years 2004, 2005, and 2006.

The department has developed both system goals and performance measures to guide the direction of the department. In developing the LRTP, department personnel worked with citizens of Missouri, transportation providers, transportation stakeholders, government agencies and other entities to determine what Missourians wanted out of a transportation system. Based on that knowledge, MoDOT developed system goals to work towards achieving the type of transportation system Missouri needs. The goals were formally adopted by the MHTC at the June 2001 MHTC meeting in the Missouri Transportation Investment Strategy (MoTIS) plan. The goals are:

- *i.* Ensure safety and security
- ii. Take care of the existing system
- iii. Relieve congestion
- iv. Broaden access to opportunity and essential services
- v. Facilitate the efficient movement of goods
- vi. Ensure Missouri's continued economic competitiveness
- vii. Protect Missouri's environmental and natural resources
- viii. Enhance the quality of our communities

During the early part of 2001, MoDOT developed organizational performance measurements for its work processes. These performance measurements affect each functional unit in the department. In particular to this audit, the department has established measures for:

- Number of STIP projects on time, behind or on schedule
- Number of projects awarded vs. programmed projects
- Cost of awarded projects vs. programmed costs
- Projects completed by month, quarter, year
- Percentage of projects completed on schedule according to Show-Me Progress signs

These measures became effective on July 1, 2001. The comparison of projects programmed for award vs. those that are actually awarded on an annual basis will be made based on these measures. Additionally, the measure of an awarded project being competed on time will be accomplished by the fourth measure listed above. Results of the measures will be reported monthly, quarterly and yearly, depending on the measure. These measures along with the others

found in the Organizational Performance Measurements report will aid MoDOT leadership in the effective management of key department operations.

Along with the performance measures, LRTP goals and annual reporting, MoDOT will continually seek to refine its accountability methods and its reporting mechanisms. MoDOT has been working with its partners to determine the best methods for reporting progress on Missouri's transportation projects. Additional new tools are being developed and should be available in the fall of this year.

AUDITOR'S COMMENT

We commend the MoDOT's recognition of the need to develop goals and performance measures and improve its accountability and reporting mechanisms. However, the goals noted in the department's response cannot be easily quantified. Furthermore, the established measures noted by the department appear to be elements of a project management system instead of measures designed to monitor the overall improvement in the quality of the state's highway system. We noted in our 1997 report on the 15-Year Plan the need to improve systems used to track projects and related costs.

We believe additional goals/measures that can be quantified and measure the overall condition of the highway system would enhance the department's system of accountability regarding the quality of the highway system, not just the quantity of projects. For example, as cited earlier in the report, establishing goals such as achieving a specified percent of roadways on the NHS as being rated good or better or a specified percent of state owned bridges being rated good or better, and then monitoring the progress toward the attainment of those goals, would allow the department to determine whether progress was being made toward improving the overall condition of the state's highway system.

This report is intended for the information of the department's management and other applicable government officials. However, this report is a matter of public record and its distribution is not limited.

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